

NTF USER OPERATIONS REQUIREMENTS

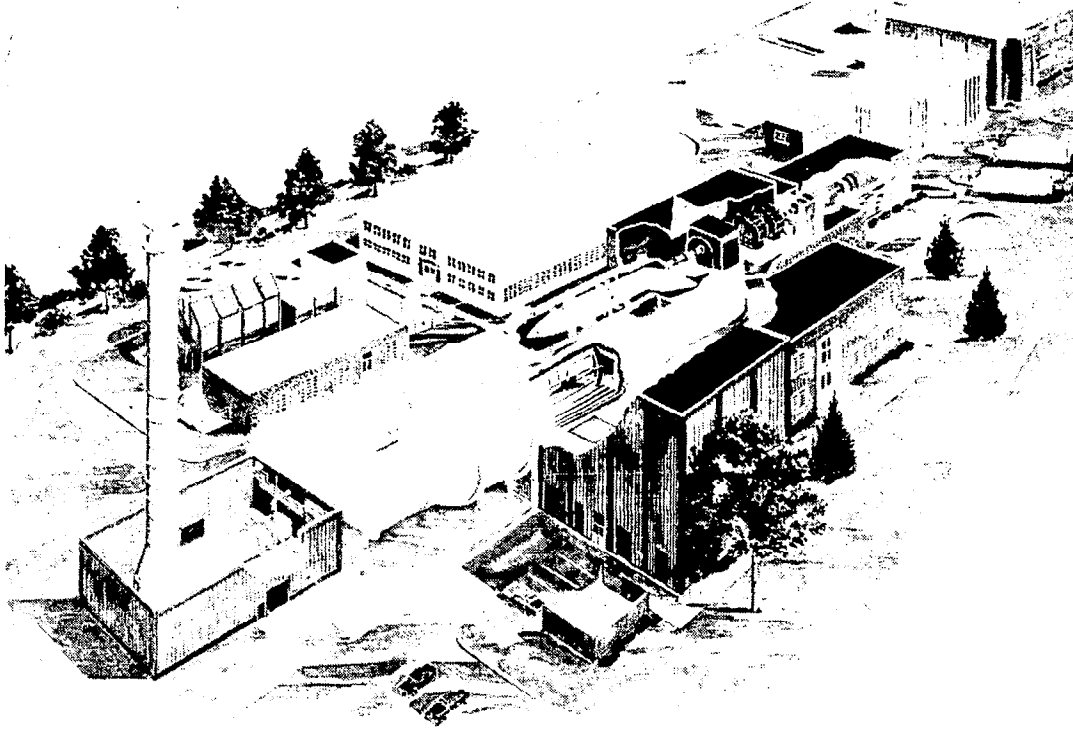
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A procedure that must be followed for a model to be accepted for testing in the NTF has been defined and is outlined in this paper. The four steps in this procedure are: planning meeting; pre-test conference; model receipt, assembly and checkout; and model installation and test. Areas of discussion at the planning meeting, which should be held prior to final design, include: general discussion of model and tests; need for additional reviews (such as preliminary and/or critical design reviews); and requirements for models as outlined in LHB 8850.1 (Wind-Tunnel Model Systems Criteria, Langley Research Center, September 1981). The pretest conference should occur at least 8 weeks prior to model delivery to NTF, and at this meeting the readiness of the model will be reviewed.

Also described in this paper is the model preparation and model handling equipment available at the NTF. There are three model assembly rooms which are secure and have direct electronic hookups to the NTF control room and computer complex. While in the model assembly room the model may be static check loaded and cryogenically cycled. Model handling carts are available for transporting the model from the model preparation room to the test section.

Finally this paper describes the model access system and shows that the turnaround time for a model modification while the model is installed in the tunnel is on the order of 1-1/2 hours plus the time required to make the model modification.

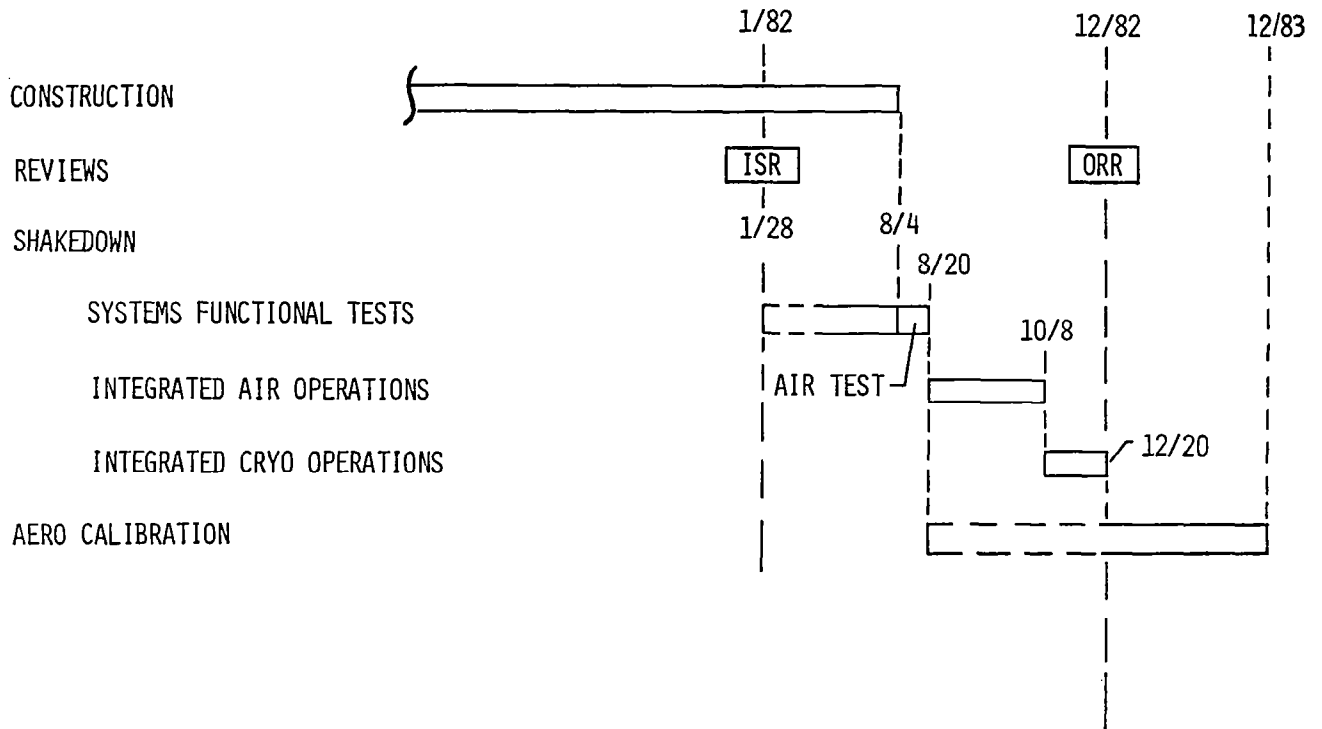
ARTIST'S CONCEPT OF NATIONAL TRANSONIC FACILITY



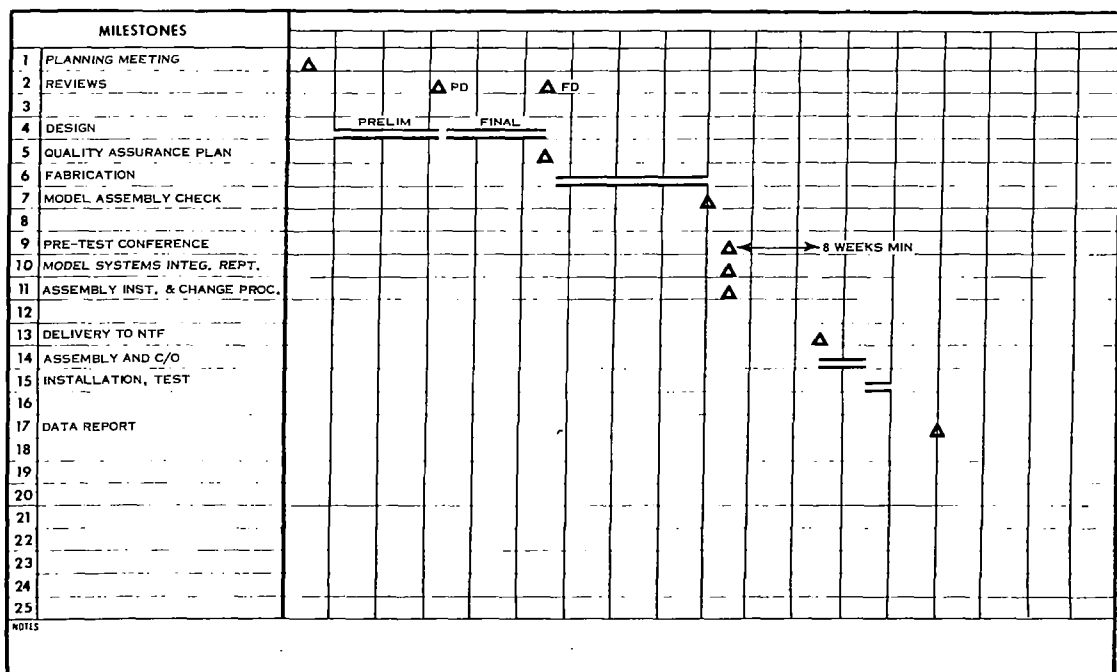
NTF CHARACTERISTICS

TEST SECTION SIZE	2.5 METERS SQUARE
PRESSURE RANGE	1 TO 9 BARS
TEMPERATURE RANGE	78 TO 340 K
MACH NUMBER RANGE	.2 TO 1.2
DRIVE POWER	9×10^7 WATTS (6.6×10^7 CONTINUOUS)
REYNOLDS NUMBER	120×10^6 ($M=1$, $\bar{c}=.25M$)
TEST GAS	AIR, NITROGEN

NTF MASTER SCHEDULE



1/16 SCALE MODEL OF THE FXXX AIRPLANE



NTF OPERATIONS

(MODEL FLOW PATH)

- o PLANNING MEETING
 - MODEL SYSTEMS INTEGRITY REPORT
 - WAIVERS
 - QUALITY ASSURANCE PLAN
- o PRE-TEST CONFERENCE
- o MODEL RECEIPT, ASSEMBLY & CHECKOUT
 - MODEL ASSEMBLY ROOM
 - BACKSTOPS
 - WEIGHT BASKETS
 - CRYOGENIC CHAMBER
 - MODEL HANDLING CART
- o MODEL INSTALLATION AND TEST
 - PLENUM/MODEL ACCESS
 - TEST SEQUENCE

PLANNING MEETING

- o OBJECTIVES
- o TIME FRAME
- o MODEL SIZE, CHARACTERISTICS
- o GENERAL INSTRUMENTATION, HARDWARE PLAN
- o DESIGN LOADS CRITERIA
- o MODEL SYSTEMS INTEGRITY REPORT
- o QUALITY ASSURANCE PLAN
- o ESTABLISH POINTS OF CONTACT

MODEL SYSTEMS INTEGRITY REPORT

- o DESIGN LOADS CRITERIA
- o STRESS ANALYSIS
- o FRACTURE MECHANICS ANALYSIS
- o FLUTTER ANALYSIS
- o DIVERGENCE ANALYSIS
- o STRUCTURAL JOINT ASSEMBLY DETAILS AND STIFFNESS
- o QUALITY INSPECTION REPORTS
- o MATERIALS PROPERTIES CERTIFICATION
- o N.D.E. EXAMINATION RESULTS
- o VALIDATION OF USE OF CERTIFIED MATERIALS
- o AS-BUILT CHARPY IMPACT & MECH. STR. PROPERTIES
- o AS-BUILT DETAIL DRAWINGS

WAIVERS

DEVIATIONS FROM LHB 8850.1 CRITERIA REQUIRE SUBMITTAL OF WRITTEN REQUESTS TO THE FACILITY SAFETY HEAD. THE FACILITY HEAD WILL BE RESPONSIBLE FOR THE ANALYSIS, EVALUATION, AND DOCUMENTATION OF THE DISPOSITION OF THE WAIVER REQUEST.

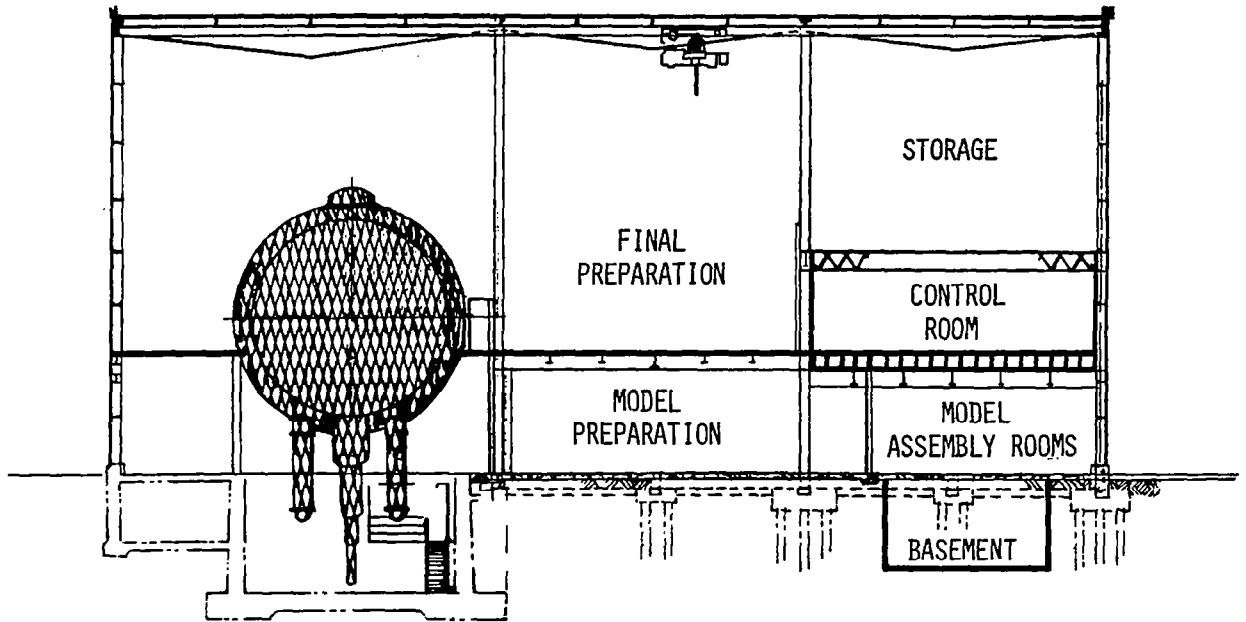
QUALITY ASSURANCE PLAN

- o REQUIRED
- o SHOULD CONTAIN PROVISIONS FOR DEFINING AND VERIFYING ARTICLE AND MATERIAL QUALITY THROUGHOUT ALL OPERATIONS
 - PROCUREMENT
 - FABRICATION
 - TEST
 - DELIVERY
 - INSTALLATION
- o SHOULD INSURE MAINTENANCE OF QUALITY WITH:
 - RECORDS
 - INSPECTION
 - TEST RESULTS

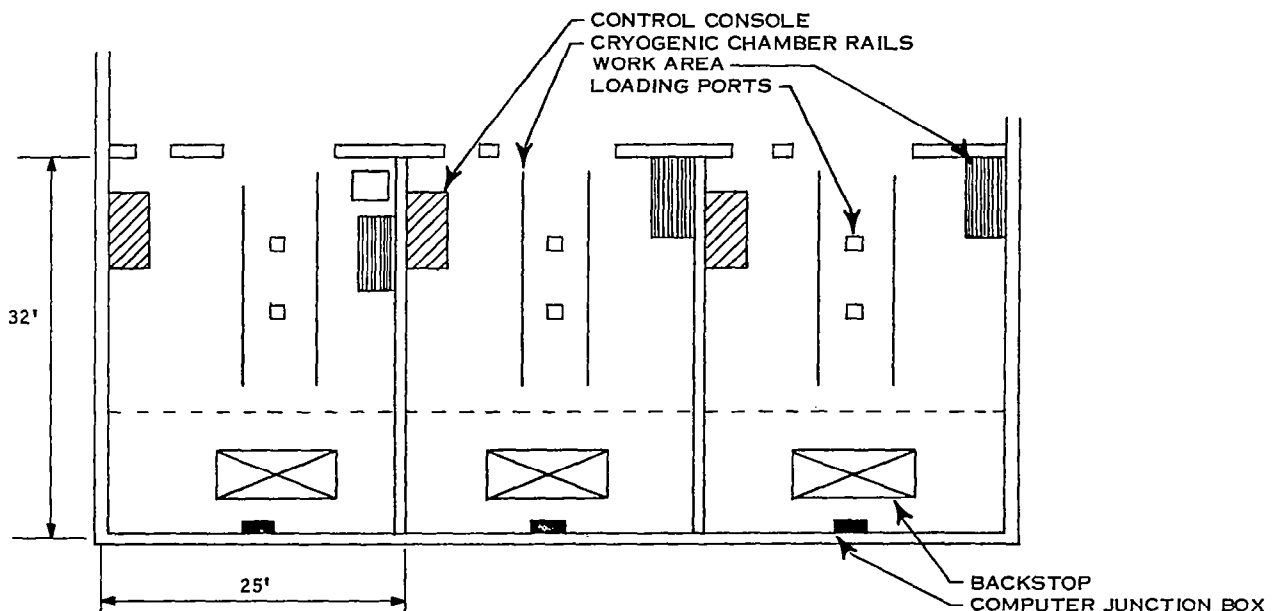
PRE-TEST CONFERENCE

- o ESTABLISH TEST PROGRAM
- o ESTABLISH INSTRUMENTATION/CALIBRATION REQUIREMENTS
- o ESTABLISH DATA ACQUISITION/REDUCTION PLAN
- o IDENTIFY TEST TEAM
 - RESEARCH PROJECT ENGINEERS
 - DATA ACQUISITION/REDUCTION
- o ESTABLISH MODEL/TEST SCHEDULE
- o CHECK OFF MODEL SYSTEMS INTEGRITY REPORT
- o CHECK OFF MODEL QUALITY ASSURANCE

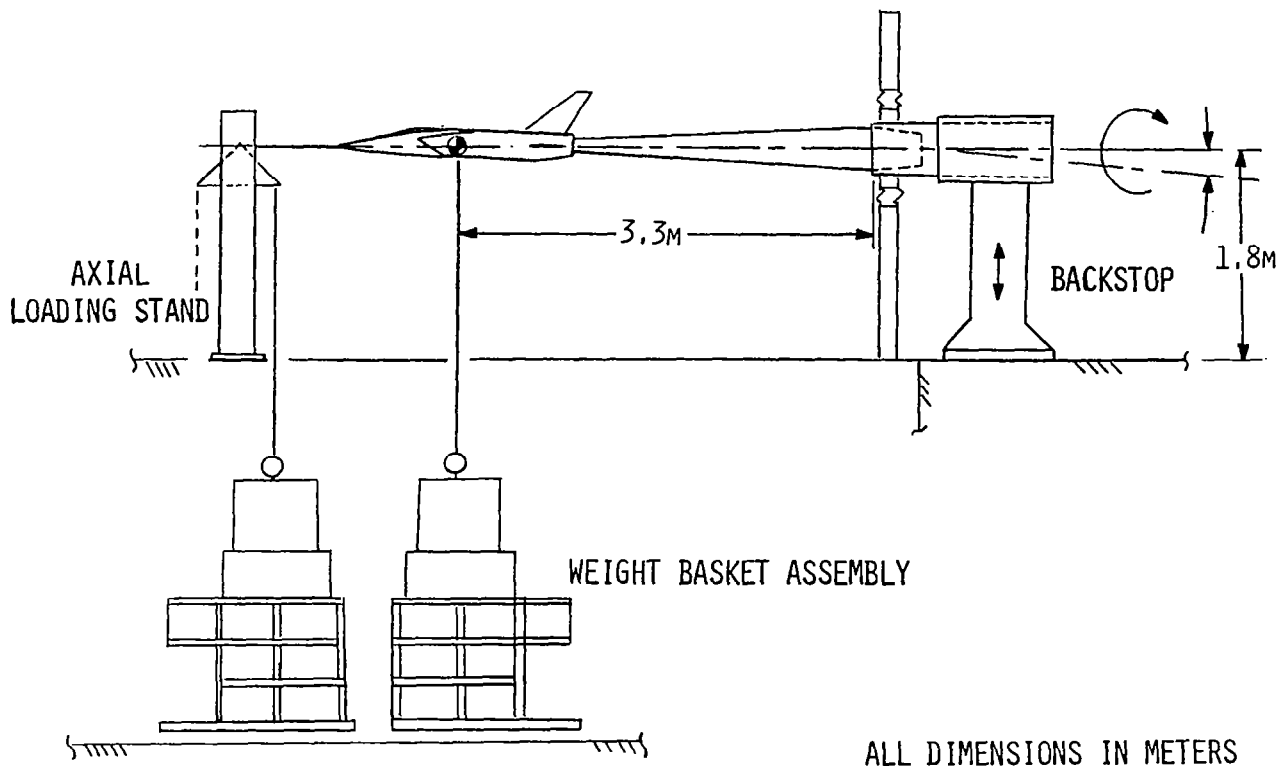
NATIONAL TRANSONIC FACILITY BUILDING



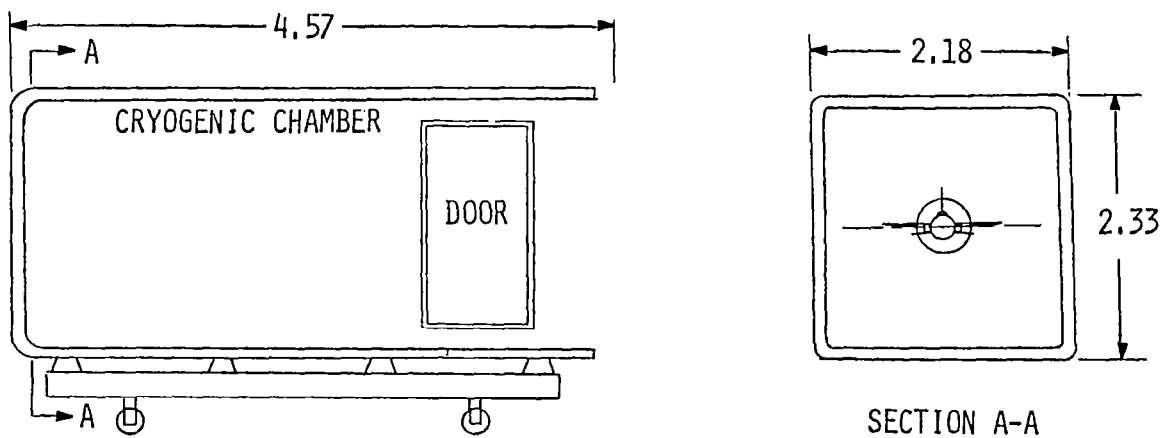
MODEL ASSEMBLY ROOMS



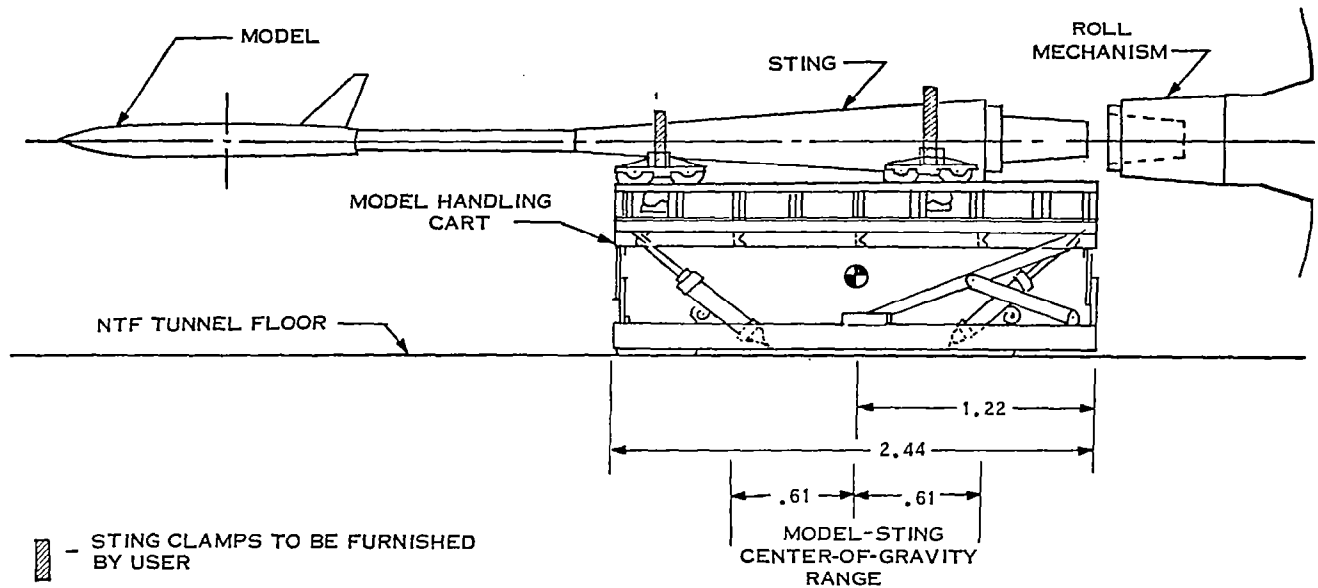
MODEL CHECKOUT EQUIPMENT



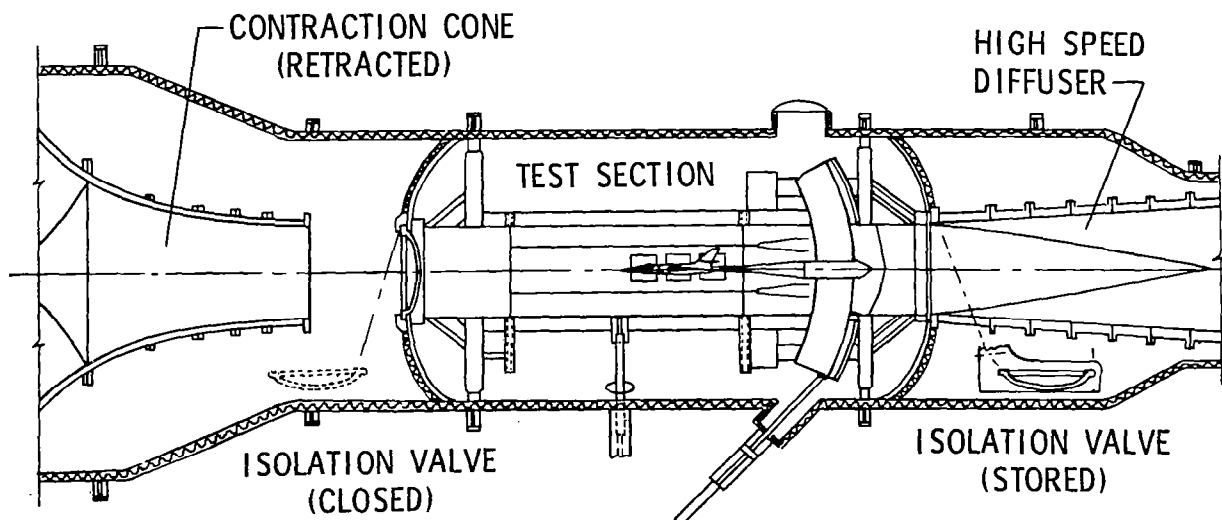
SCHEMATIC OF CRYOGENIC CHAMBER



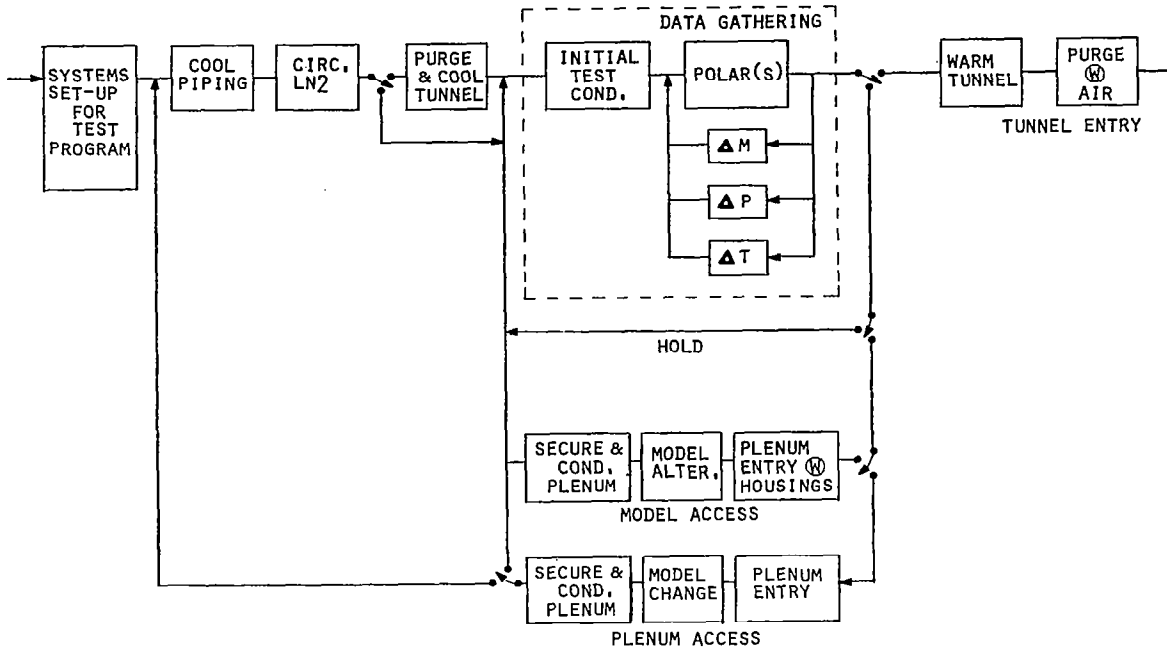
MODEL-STING SUPPORT SYSTEM



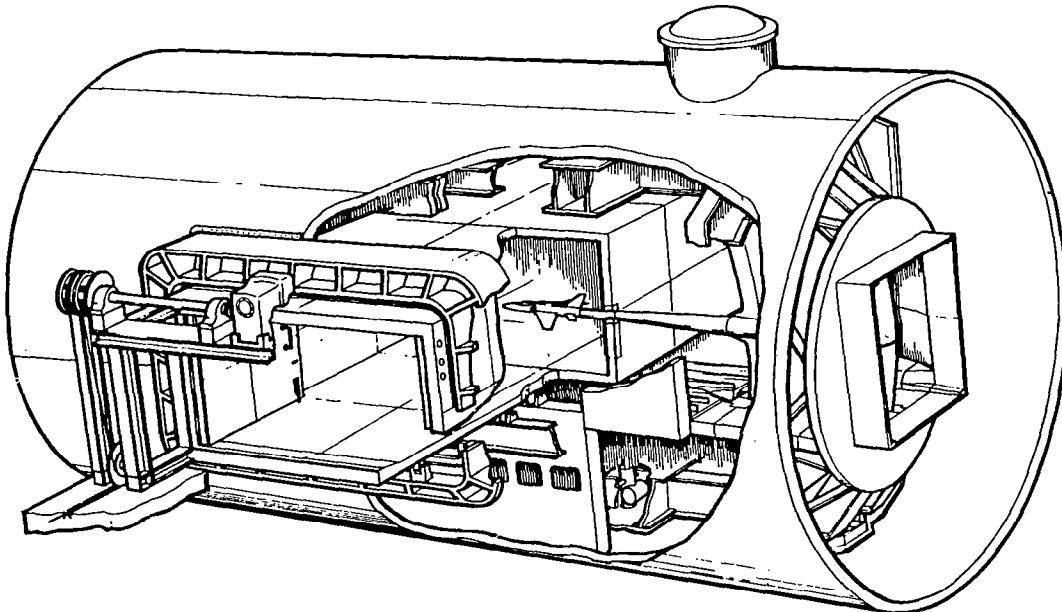
NATIONAL TRANSONIC FACILITY TEST PLENUM ISOLATION SYSTEM



NTF OPERATION



MODEL ACCESS SYSTEM



MODEL ACCESS - ACTUATING TIMES

<u>FUNCTION</u>	<u>TIME</u>
CONDITION PLENUM	18 MIN
INSERT TUBES	3 MIN
CONDITION TUBES/WARM MODEL	37 MIN
CHANGE/SERVICE MODEL	VARIABLE
PREPARE FOR TUBE EXTRACTION	5 MIN
RETRACT TUBES	3 MIN
RETURN TO OPERATING CONDITIONS	18 MIN
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TOTAL	84 MIN + VARIABLE